UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/041,597	01/10/2002	Hironobu Yamakawa	500.41074X00	5097

20457 7590 06/01/2005

ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-3873

EXAMINER	
DIAMOND, ALAN D	

ART UNIT	PAPER NUMBER
1753	

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/041,597	YAMAKAWA ET AL.	
	Examiner	Art Unit	
	Alan Diamond	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *10 and 19* is/are allowed.

6)☒ Claim(s) *1-9,11-18 and 20-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Comments

1. The objection to the drawings has been overcome by Applicant's amendment of Figure 8.

2. The objection to the specification has been overcome by Applicant's amendment thereof. It is acknowledged that the term "palate" on page 1, at line 1, was corrected by the amendment to the specification filed 09/07/2004 and 10/07/2004.

3. The 35 USC 112, second paragraph, rejection of claims 8, 11, 17, and 20 has been overcome by Applicant's amendment of the claims.

Claim Objections

4. Claim 22 is objected to because of the following informalities: In claim 22, at line 3, the word "a" should be deleted. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-9, 11-18, and 20-26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

At the last line in each of claims 1 and 2, the "integral casting of the planar plate" is not supported by the specification, as originally filed. The same applies to dependent claims 3-9, 11-18, and 20-26. The specification, as originally filed, does support an integral molding of the planar plate (see page 12, line 27), but is silent concerning "casting".

At lines 1-2 in each of claims 21, 22, 24, and 25, at lines 4-5 in claims 21 and 22, and at line 4 in claims 24 and 25 the term "at least one access opening" is not supported by the specification, as originally filed. The specification does teach solution reservoirs (30) (see, for example, page 9, line 9). However, a solution reservoir is not sufficient support for a generic "access opening". Furthermore, plural solution reservoirs is not support for the range "one or more". It is suggested that said term be changed to "solution reservoirs".

In claim 21, the limitation that "the second flat and smooth incoming window for introducing the excitation beam into the planar plate is not formed on a same surface of the planar plate as the at least one access opening" is not supported by the specification as originally filed. Indeed, in the instant figures, each solution reservoir (30) has a portion formed on the same surface of the planar plate as said second flat and smooth incoming window.

In claim 22, the limitation that the "second flat and smooth outgoing window for emitting the fluorescence outside of the planar plate is not formed on a same surface of the planar plate as the at least one access opening" is not supported by the specification, as originally filed. Indeed, in the instant figures, each solution reservoir

(30) has a portion formed on the same surface of the planar plate as said second flat and smooth outgoing window.

At line 2 in each of claims 23 and 26, the range "on at least two sides thereof" for the air gap is not supported by the specification, as originally filed. It is suggested that "on at least two sides thereof" be deleted from each of claims 23 and 26.

In claim 24, the limitation that "the second incoming window for introducing the excitation beam into the planar plate is not formed on a same surface of the planar plate as the at least one access opening" is not supported by the specification as originally filed. Indeed, in the instant figures, each solution reservoir (30) has a portion formed on the same surface of the planar plate as said second incoming window.

In claim 25, the limitation that the "second outgoing window for emitting the fluorescence outside of the planar plate is not formed on a same surface of the planar plate as the at least one access opening" is not supported by the specification, as originally filed. Indeed, in the instant figures, each solution reservoir (30) has a portion formed on the same surface of the planar plate as said second outgoing window.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-8, 12-17, 23, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 09-288090, herein referred to as JP '090.

JP '090 teaches an electrophoresis apparatus comprising a planar plate (14,15) having capillary channels (20-21) formed therein for electrophoretic separation, a light irradiating means (3) for irradiating an excitation beam into a detection part in channel (20), and a fluorescent detecting means (35) for detecting a degree of fluorescence which is generated by a sample by the excitation beam (see the attached English abstract; Figure 1; and paragraphs 0005 to 0007). As seen in Figure 1, the channels (20,21) have what appear to be a rectangular cross-section. With respect to claim 1, the end of channel (22) which is closest to channel (20) encompasses the instant second flat and smooth incoming window formed in a surface of the planar plate. With respect to claim 2, the end of channel (22) which is closest to channel (20) encompasses the instant second incoming window formed in a surface of the planar plate. Alternatively, with respect to claim 2, the end of the channel (22) at the edge of the plate (14) reads on the instant second incoming window formed in a surface of the planar plate. With respect to claims 1 and 2, the portion of the side-wall of channel (20) that is near the end of the channel (22) reads on the instant first flat and smooth incoming window. Note that there is clearly an excitation transmission path between said side-wall of channel (20) and either said end of the channel (22) which is closest to the channel (20) or said end of the channel (22) at the edge of the plate (14). With respect to claims 1 and 2, when (14) and (15) are secured together (paragraph 0007), the lower surface of (15) is directly above channel (20) and below the detector (35), and encompasses the instant first flat and smooth outgoing window. Furthermore, with respect to claims 1 and 2, when (14) and (15) are secured together (paragraph 0007),

the upper surface of (15) opposite said lower surface of (15) and below the detector (35), encompasses the instant second flat and smooth outgoing window. Clearly, there is a fluorescent transmission path through (15), and thus, (15) is transparent, as per instant claims 3 and 12. The channel (22) and the slit (36) encompass the "at least one optical component" that is recited in claims 1 and 2. The channel (22) and the slit (36) are the same as here claimed, whether they are formed during molding of the planar plate or machined into the planar plate after the molding.

With respect to claims 4 and 13, JP '090's optical fiber (8) encompasses the instant light converging means (see paragraph 0007).

With respect to claims 5 and 14, JP '090's slit (36) encompasses the instant light splitting means (see paragraph 0008).

With respect to claims 6 and 15, JP '090's light filter (37) encompasses the instant spatial filter (see paragraph 0008).

With respect to claims 7, 8, 16, and 17, it is the Examiner's position that JP '090's plate (14,15) is essentially the same as that produced by the claimed product-by process.

With respect to claims 23 and 26, the slit (26), through which fluorescent light will be detected, will most certainly have some air since the apparatus in not in a vacuum.

JP '090 teaches the limitations of the instant claims other than the difference which is discussed below.

Looking at JP '090's Figure 1, the light enter through the side of the plate (14,15) and the fluorescence exits from the top of plate (14,15). However, according to claim 1,

it would appear that light enters from the bottom, and the fluorescence exits from a side. However, "side", "top" and "bottom" are relative terms. When JP '090's case (1) in Figure 2 is turned on its side such that the light source (3) in Figure 1 is vertical (and facing up) rather than horizontal, then light enters from the bottom, and the fluorescence exits from a side. Alternatively, since the terms "side", "top" and "bottom" are relative, if one is looking at Figure 1 from the side, then the location of irradiating means (3) could be considered the bottom, and thus, the detector (35) would be on a side. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have turned JP '090's case (1) on its side to that the electrophoresis could be performed in a tight location requiring the case (1) to be turned in its side. Alternatively, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have looked at JP '090's apparatus from the side, and thus, consider the location of irradiating means (3) to be the bottom and the location of the detector (35) to be on a side wall because a skilled artisan can look at JP '090's apparatus any way he/she pleases.

According to claim 2, it would appear that light enters from the side, and the fluorescence exits from the bottom. However, as noted above "side", "top" and "bottom" are relative terms. When JP '090's case (1) in Figure 2 is turned upside down, the light still enters from the side, and then, the fluorescence exits from the bottom. Alternatively, since the terms "side", "top" and "bottom" are relative, if one is upside down and looking at Figure 1, then the location of irradiating means (3) would still be considered the side, but, the detector (35) would be at the bottom. It would have been

obvious to one of ordinary skill in the art at the time the invention was made to have turned JP '090's case (1) upside down so that the electrophoresis could be performed in a location requiring the case to be upside down. Alternatively, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have been upside down while looking at JP '090's apparatus because a skilled artisan can look at JP '090's apparatus any way he/she pleases.

9. Claims 9, 11, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '090 as applied to claims 1-8, 12-17, 23 and 26 above, and further in view of Li (WO 00/06996).

JP '090, as relied upon for the reasons recited above, teaches the limitations of instant claims 9 and 18, the difference being that JP '090 does not specifically teach that it plate (14,15) can be made from a thermosetting resin. Li is relied upon for showing that such a plate for electrophoresis can be made from polymers, such as polydimethylsiloxane, which is thermosetting (see page 17, lines 7-14; and Figures 3A and 4). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have prepared the plate (14,15) in JP '090's electrophoresis apparatus from a thermosetting polymer such as polydimethylsiloxane because polydimethylsiloxane is a know material for preparing such a plate, as taught by Li.

JP '090, as relied upon for the reasons recited above, teaches the limitations of instant claims 11 and 20, the difference being that JP '090 does not specifically teach plural of its channel (20) so that the light from the irradiating means (3) can pass through the plural channels at the same time. However, the use of multiple parallel

channels, wherein the light form a source is irradiated on the channels at the same time is known in the art, as seen in Figures 1A, 3A, and 4-6 of Li. The use of multiple parallel channels provides the advantage that multiple samples can be analyzed at once (see also page 11 of Li, which describes said Figure 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used plural of JP '090's channel (20) in the plate (14,15) so that the light from the irradiating means (3) can pass through the plural channels at the same time, and thus, multiple samples can be analyzed at once, as shown by Li.

10. Claims 21, 22, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '090 as applied to claims 1-8, 12-27, 23, and 26 above, and further in view of JP 11-352102, herein referred to as JP '102.

JP '090, as relied upon for the reasons recited above, teaches the limitations of claims 21, 22, 24, and 25, the difference being that JP '090 does not specifically teach at least one access opening for communication of fluid in its channel, as here claimed. However, the use of such access openings is conventional in the art, as shown by JP '102 (see the entire document, in particular Figures 1 and 2). With access openings as shown in JP '102's Figure 1, the second flat and smooth incoming and the second flat and smooth outgoing window of JP '090 will not be formed on a same surface of the planar plate as said access openings, as here claimed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided JP '090's electrophoresis apparatus with at least one access opening for communication of

fluid in JP '090's channel because the use of such an access opening is conventional in the art, as shown by JP '102.

Response to Arguments

11. Applicant's arguments filed March 15, 2005 have been fully considered but they are not persuasive.

Applicant argues that claim 1 now recites that the channel, the at least one optical component, the first flat and smooth incoming window, the second flat and smooth incoming window, the excitation transmission path, the first flat and smooth outgoing window, the second flat and smooth outgoing window and the fluorescent transmission path are part of an integral casting of the planar plate, and that JP '092 and Li do not disclose or suggest an integral casting of the planar plate. However, this argument is not deemed to be persuasive because JP '090's channel (22) and slit (36) encompass the "at least one optical component" that is recited in claims 1 and 2. The channel (22) and the slit (36) are the same as here claimed, whether they are formed during molding of the planar plate or machined into the planar plate after the molding. The instant "integral casting" limitation, which is a product-by-process limitation, does not impart a distinguishing feature to the claimed invention.

Applicant argues that "[o]ne important feature of the present invention is the provision of the electrophoresis apparatus in which optical system components are integrally incorporated with passages." However, this argument is not deemed to be persuasive because, as noted in the preceding paragraph, JP '090's channel (22) and

slit (36) encompass the "at least one optical component" that is recited in claims 1 and 2.

Applicant argues that "another important feature of the present invention is the provision of such a configuration that a light beam is incident upon the bottom part of the planar plate and egresses from a side part thereof, or vice versa", and that JP '090 discloses incidence of a light beam upon the top surface of the substrate. However, this argument is not deemed to be persuasive because the terms "side", "top" and "bottom" are relative. If one is looking at JP '090's Figure 1 from the side, then the location of irradiating means (3) could be considered the bottom, and thus, the detector (35) would be on a side. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have turned JP '090's case (1) on its side to that the electrophoresis could be performed in a tight location requiring the case (1) to be turned in its side. Alternatively, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have looked at JP '090's apparatus from the side, and thus, consider the location of irradiating means (3) to be the bottom and the location of the detector (35) to be on a side wall because a skilled artisan can look at JP '090's apparatus any way he/she pleases.

Applicant argues that the light beams simultaneously pass through a plurality of passages. However, this argument is not deemed to be persuasive because JP '090 teaches this feature. In any event, applicant is arguing a limitation that is not in the instant claims.

Allowable Subject Matter

12. Claims 10 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. The following is a statement of reasons for the indication of allowable subject matter: Claims 10 and 19 are allowable because if there were multiple of JP '090's plates (14,15) in the apparatus, then there would at least have to be multiple of the irradiating means (3), i.e., one irradiating means (3) for each plate. Claims 10 and 19 require a plurality of the instant planar plates, such that a single excitation beam from the light irradiating means can be led through the channels in the planar plates layered one upon another.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Diamond whose telephone number is 571-272-1338. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m. ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alan Diamond
Primary Examiner
Art Unit 1753

Alan Diamond
May 26, 2005